

Notes on North American Willows. IV.

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1. SALIX ARCTICA Pallas. Flora Rossica, vol. 1, pt. ii, p. 86. *S. crassijulis* Trev. ex Traut. Sal. frigid. p. 308. *S. diplodictya* Traut. l. c. p. 307. *S. Pallasii* Anders. DC. Prod., vol. 16, pt. ii, p. 285.

2. S. BROWNI. *S. arctica* R. Br. Bot. Ross Voy. 2 ed., vol. 2, p. 194. Melv. Isl. Pl. p. cclxx, 11 (not Pall.). Hook. Fl. Bor.-Amer. ii, p. 152. Ledebour, Fl. Ross. ii, p. 86. Icon. Fl. Ross. Tab. 460. Anders., DC. Prod., 16. 2. 286 (excl. var. *nervosa*).

*Salix arctica* Pallas was published in 1788. The species is a very peculiar one, of striking features, easily recognized, and the description given is graphic and wholly free from ambiguity. In the Botany of Ross' Voyage, London, 1819, Robert Brown printed in a list as a new species his *S. arctica*, the description of which was published in the *Chloris Melvilliana*, List of Plants collected in Melville Island under Capt. Perry, London, 1823. The earlier *S. arctica* of Pallas appears to have been unknown to Brown; at any rate he makes no reference to it. With the exception of Ledebour, who misapprehended *S. arctica* Pall., and united with it as a synonym *S. arctica* R. Br., the fact came to be recognized by well informed botanists that the name *S. arctica* had been given to two distinct species. Both names continued to be sustained, one by its manifest priority, the other by the preponderating authority of Robert Brown. The species were distinguished in each instance by citing one author and excluding the other. Thus it was *S. arctica* Pall. (not R. Br.) or *vice versa*, *S. arctica* R. Br. (not Pall.) This state of things continued unchanged down to the time when Anderson's revision of the entire genus for De Candolle's *Prodromus* precipitated the suppression of one or the other of the two names. The older species now received the name of *S. Pallasii* And., and the authority of Pallas was carried over and imposed upon *S. arctica* R. Br. *S. arctica* Pallas became *S. Pallasii* n. sp., and *S. arctica* R. Br. became *S. arctica*

Pall.; the two species (aside from the shifting of names) standing in the same relation precisely as heretofore. Had *S. arctica* Pall. been written down a synonym of *S. Pallasii*, and *S. arctica* R. Br. been left intact, some degree of consistency could be urged in behalf of an author who throughout pays little or no regard to claims of priority. It might be argued that *S. arctica* R. Br. was so deeply embedded in the science that it could not and ought not to be torn out by the roots, and that it were better, since one of the two names must be suppressed, that the more obscure—even if confessedly the older one—be sacrificed. Any such apology, however, is felt to be out of place when we have a new name given to the old *S. arctica* Pall., the authority of Pallas transferred to a species of which he was entirely ignorant, and Robert Brown left out entirely.<sup>1</sup>

But we are not obliged to rest our judgment solely upon the characters given, though in the present instance this evidence is in itself conclusive. Not only does the name, *S. Pallasii*, imply the earlier description by Pallas, but we have *Andersson's own admission* that he had seen the specimens of Sujef (type of *S. arctica* Pall!) "in the herbarium of Pallas, inscribed *S. arctica*," and that these did not differ from his *S. Pallasii*, var. *diplodictya*!

The venerable Dr. Trautvetter, whose special study of arctic willows and whose familiarity with the work done on *Salix* by Russian botanists, must combine to give his opinion a weight beyond that of Andersson's, writes in a letter: "*S. diplodictya* differs from *S. crassijulis* (*S. arctica* Pall. not R. Br.), only in the leaves green and shining beneath, and it may be questioned if the species is well founded." Here, in a brief sentence, we have the pith and substance of the

<sup>1</sup>*S. arctica* Pall.

"Folia pro planta majuscula pollice latiora, obovata, apice latiora rotundata, integerrima, crassius reticulata, subtus tenuissime villosa, amenta fœminea magna bipollicaria, digiti minimi crassitie e lateribus ramorum, longius pedunculata duobus, tribusve foliis majusculis stipata, capsulæ conicæ, tomentosa-canæ." *Flora Rossica*.

"Capsulæ confertæ," Pall., and "amentis densifloris," And.—meaning the same—could not be conveniently arranged opposite each other in the schedule.

Pallas died 1811, twelve years before *S. arctica* R. Br. (based upon specimens brought home by British explorers) was published.

*S. Pallasii* et *a. crassijulis* And.

"Folia supra medium pollice latioribus, obovatis, apice rotundatis, integerrima, distincte reticulato-nervosis, subtus sericeis, amentis fœmineis fere bipollicaria, crassiusculis, lateralibus pedunculo superne sat longe nudo inferne foliis 2-3 instructo, capsulis conicis, longe cinereo-villosis." DC. *Prod.*

whole matter. 1, That *S. diplodictya* is not distinct from *S. crassijulis*; 2, that *S. crassijulis* is synonymous with *S. arctica* Pall. (which is the main point); and finally, 3, the familiar assertion that the *S. arctica* of Pallas is not the *S. arctica* of Robert Brown—a statement which can not be made too emphatic, in view of the placid acquiescence, for years past, in the dictum of Andersson to the contrary.

It is to be regretted that a name grown so familiar as that of *S. arctica* R. Br. must needs be disturbed; on the other hand, the open fact of the priority of *S. arctica* Pall. can not be ignored, and as what Sir William J. Hooker was wont to call "Mr. Brown's *S. arctica*" was only sustained by the constant mention of the name of the distinguished author, let us hope that the substitution of this name for the one pre-occupied may in a large measure preserve unbroken the old associations.

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### The Diatom marshes and Diatom beds of the Yellowstone National Park.

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It is well known that the minute algæ, to which the name of diatoms has been given, possess, in a remarkable degree, the power of separating silica from solution in the waters in which they live. This action is the more remarkable because the silica is often present in such exceedingly small amounts that an almost inconceivable activity on the part of the plant is required to obtain an adequate supply to form their frustules, while the separation of the silica must itself be referred to some vital force exerted by the plant during its growth. It is this action which gives to this low form of life its importance as a geological agent.

As the Diatomaceæ exist under very diverse and extreme conditions of environment, occurring in the icy waters of polar seas, the heated currents of the tropics, and even in the almost boiling waters of hot springs, they are in consequence the most widely distributed form of life known, and their common occurrence in ponds and ditches is well known to every microscopist. Nevertheless, contemporaneous deposits formed of their remains are usually small in comparison with